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(71)Applicant : FUKUOKA INSTITUTE OF
TECHNOLOGY
NAPPU ENTERPRISE KK

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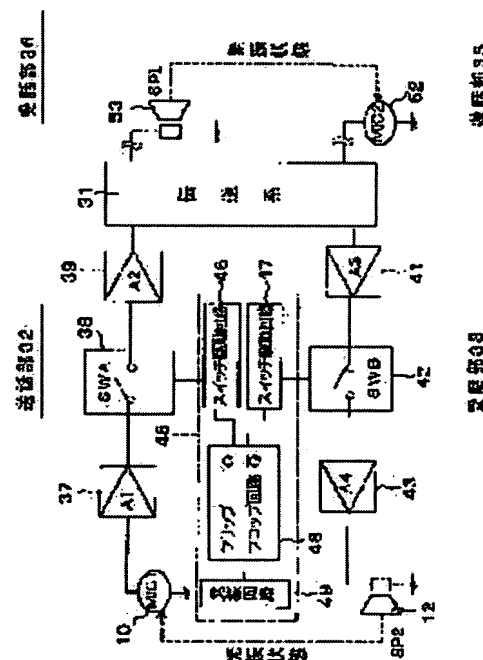
(72)Inventor : SETO SHINJI
TANIGUCHI YASUTOSHI

(54) OSCILLATION PREVENTING CIRCUIT

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an oscillation preventing circuit that attains a stable two-way speech without causing oscillation between transmission/reception sections of both communication units where a transmission section and a reception section are installed at the same place or close to each other without the need for gain adjustment to prevent the oscillation.

SOLUTION: The oscillation preventing circuit is used for communication between two points where one communication unit and other communication unit are connected via a transmission system 31 to attain 2-way communication. The oscillation preventing circuit is provided with switch circuits 38, 42 that are respectively provided to a transmission section 32 and a reception section 33 to turn on/off the flow of a signal and with a control circuit 45 that controls the switch circuits so that the switch circuit of the reception section is turned off when the switch circuit of the transmission section is turned on and the switch circuit of the reception section is turned on when the switch circuit of the transmission section is turned off in a way that both the switch circuits are not simultaneously



turned on.

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CLAIMS

[Claim(s)]

[Claim 1] A microphone for one communication equipment to send signals, such as voice, and the transmission section including an amplifying circuit, The transmission section in which it consists of the receiver sections including the loudspeaker or earphone which receives information, and an amplifying circuit, and the communication equipment of another side includes the same microphone and an amplifying circuit, While [two points] consisting of the receiver sections including a loudspeaker or an earphone, and an amplifying circuit,

connecting both [these] communication equipment through a transmission system and two-way conversation's being possible, it is what is used for a communication link. The switching circuit which is established in the transmission section and the receiver section, respectively, and turns the flow of a signal on and off, About these switching circuits, when the switching circuit of the transmission section is ON, the switching circuit of the receiver section becomes off. The oscillation prevention circuit characterized by having the control circuit controlled for the switching circuit of the receiver section to serve as ON when the switching circuit of the transmission section is OFF, and not to always become ON at coincidence.

[Claim 2] The oscillation prevention circuit according to claim 1 where a control circuit consists of one pair of switch drive circuits which drive the switching circuit of the transmission section, and the switching circuit of the receiver section, a flip-flop circuit which carries out change actuation of the turning on and off by turns so that said both switching circuits always may not become coincidence with ON about these switch drive circuit, and an oscillator circuit which operates this flip-flop circuit.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] this invention -- objects for mobile communications, such as a cellular phone or PHS, -- including a cordless handset, it is included in various kinds of communication equipment, such as a transmitter for a guide of an earphone microphone common telephone and at large, a translator, a deaf-mute, or the loudspeaker for vocal-cords damage persons and a travel agent, a transmitter for announcer, a transmitter for conductors of an electric car, and a head set for operators, and is related with the oscillation prevention circuit which has effectiveness in oscillation prevention of these communication equipment.

[0002]

[Description of the Prior Art] When the cordless handset of a cable and wireless used for mobile communications, such as a cellular phone or PHS, as communication equipment is known and it carries out the communication equipment and two-way conversation of the other party conventionally through a main phone and the transmission system which contains the wireless electric-wave junction sections for a telephone, such as NTT DoCoMo, further from this cordless handset, the loop formation by electrical coupling including the acoustic wave transmitted in the space of the transmitter/receiver part of both communication equipment is formed, and an oscillation phenomenon may arise. Since this oscillation phenomenon is produced when the loop gain of electrical coupling becomes one or more Unification and this ** of the transmission section and the receiver section in order to guarantee a loop gain to one or less from the first There is a trouble that can seldom bring close, can seldom enlarge gain of communication equipment, or the cure against a thing is required, and it is big when advancing reduction of the cure against a noise of communication equipment, a miniaturization, lightweight-izing, and a manufacturing cost etc. also in any of a cable and wireless.

[0003]

[Problem(s) to be Solved by the Invention] Then, this invention solves the above conventional troubles, an oscillation phenomenon does not need to arise between the transmitter/receiver parts of both communication equipment, and it can install the transmission section and the receiver section in this ** or near, moreover does not need to apply the gain control of oscillation prevention, and aims at offering the oscillation prevention circuit which can make stable two-way conversation possible.

[0004]

[Means for Solving the Problem] In order to attain said purpose, invention of claim 1 A microphone for one communication equipment to send signals, such as voice, and the transmission section including an amplifying circuit, The transmission section in which it consists of the receiver sections including the loudspeaker or earphone which receives a signal, and an amplifying circuit, and the communication equipment of another side includes the same microphone and an amplifying circuit, While [two points] consisting of the receiver sections including a loudspeaker or an earphone, and an amplifying circuit, connecting both [these] communication equipment through a transmission system and two-way conversation's being possible, it is what is used for a communication link. The switching circuit which is established in the transmission section and the receiver section, respectively, and turns the flow of a signal on and off, It is characterized by having the control circuit which controls these switching circuits for the switching circuit of the receiver section to become off when the switching circuit of the transmission section is ON, and for the switching circuit of the receiver section to serve as ON, and not to always become ON at coincidence when the switching

circuit of the transmission section is OFF.

[0005] Invention of claim 2 is characterized by a control circuit consisting of one pair of switch drive circuits which drive the switching circuit of the transmission section, and the switching circuit of the receiver section, a flip-flop circuit which carries out change actuation of the turning on and off by turns so that said both switching circuits always may not become coincidence with ON about these switch drive circuit, and an oscillator circuit which operates this flip-flop circuit in claim 1.

[0006]

[Embodiment of the Invention] The gestalt of 1 implementation of this invention is explained with reference to a drawing. the object for mobile communications whose gestalt of operation is a cellular phone or PHS -- it carries out to a cordless handset. this object for mobile communications -- the environment where a cordless handset is used is as that outline being shown in drawing 1 and 2, and 1 manages wireless electric waves, such as mobile communications which are a cellular phone or PHS, for example, shows the wireless electric-wave junction sections for a telephone, such as the Nippon Telegraph and Telephone Corporation (NTT) head office. 2 is a cellular phone as mobile communications which receive the wireless electric wave (heavy current wave) sent from the wireless electric-wave junction section 1, and is equipped with the function as usual telephones, such as a transmitter and a receiver. 3 is a cordless handset for cellular-phone 2, and is equipped with the transmitter-receiver 4 and the transmitter-receiver 5. A transmitter-receiver 4 will transmit an electric wave (feeble electric wave) weaker than this wireless electric wave to a transmitter-receiver 5, if it is attached in the external connection terminal 6 of a cellular phone 2 removable and a cellular phone 2 receives a wireless electric wave. This feeble electric wave is an electric wave of extent which cannot touch regulation of Wireless Telegraph Law, for example, is an electric wave which reaches only the range of about 5m. A transmitter-receiver 5 receives the feeble electric wave from a transmitter-receiver 4, and tells the arrival to a cellular phone 2. From a cellular phone 2, if it puts in another way, it will have become micro [hearing aid extent], and a transmitter-receiver 5 is attached in small and people with a cellular phone 2 removable.

[0007] The transmitter/receiver part 7 formed in the magnitude included in the hole of a lug projects to a transmitter-receiver 5 from the front face, and is formed in it in one. The microphone 10 for a message, the incoming call delivery volume loudspeaker 11, and the loudspeaker 12 for a message are summarized to the transmitter/receiver part 7. 15 is a rechargeable battery. Moreover, the switch which SW1 makes an OFF state the melody sound which tells that a cellular phone 2 is receiving a message by one-touch, and carries out turning on and off of transmitter-receiver 5 the very thing by long touch, the switch whose message SW2 chooses the partner of arbitration from two or more phase hands registered into the telephone directory memory built in the cellular phone 2, and is enabled, and SW3 are

switches which carry out turning on and off of the talk state of the cellular phone 2 performed through a cordless handset 3. By the hook 23 which was hooked on a pocket person's lug by the hook 21 attached in the front-face side through the closing motion hinge region 20 as shown also in drawing 2 , or was attached in the rear face, if the transmitter-receivers 5 of a cordless handset 3 are a chest pocket, the neck, and a woman, the string of INNA etc. will be equipped with them. The inside W of drawing expresses the closing motion width of face of hook 21.

[0008] Drawing 3 is the block diagram of the oscillation prevention circuit included in the transmitter-receiver 5, and the usual transceiver circuit containing said SW1-SW3 is omitted in this drawing. 31 is a transmission system containing a cellular phone 2 or the wireless electric-wave junction section 1, the transmission section 32 and the receiver section 33 which were prepared in the transmitter/receiver part 7 of said transmitter-receiver 5 which becomes a oneself side are shown, and the left-hand side of this transmission system shows the transmission section 35 and the receiver section 36 which were prepared in the transmitter/receiver part of the communication equipment with which this right-hand side turns into the other party. The transmission section 32 by the side of itself consists of said microphone 10, an amplifying circuit 37, a switching circuit 38 that turns the flow of a signal on and off, and an amplifying circuit 39. The receiver section 33 consists of the amplifying circuit 41, a switching circuit 42 which turns the flow of a signal on and off, an amplifying circuit 43, and said loudspeaker 12.

[0009] The control circuit 45 which is made to generate a clock pulse and controls turning on and off of both [these] the switching circuits 38 and 42 is connected to the switching circuit 38 and the switching circuit 42. The control circuit 45 consists of switch drive circuits 46 and 47, a flip-flop circuit 48, and an oscillator circuit 49. The switch drive circuit 46 is connected to a switching circuit 38, and the switch drive circuit 47 is connected to the switching circuit 42. When a switching circuit 42 is ON, as a flip-flop circuit 48 is connected to both the switch drive circuits 46 and 47, a switching circuit 42 becomes off about both the switch drive circuit when a switching circuit 38 is ON, and a switching circuit 38 becomes off, he is trying for both the switching circuits 38 and 42 not to serve as ON at coincidence. The switch timing of both the switching circuits 38 and 42 is shown in drawing 4 . Moreover, an oscillator circuit 49 is connected to a flip-flop circuit 48, and a flip-flop circuit 48 is operated. The transmission section 35 and the receiver section 36 of the other party omit an amplifying circuit etc., and show only a part of configurations. That is, the transmission section 35 of the other party has a microphone 52, and the receiver section 36 has the loudspeaker 53.

[0010] The above mentioned switch SW1 thru/or the above mentioned switch SW3 If one of switches is set to ON at 2 coincidence at the time of a talk state (for example, switches SW1 and SW2) the microphone 10 of the transmission section 32 becomes off, and its voice sends

to the other party -- not having -- again -- either -- if a switch is set to ON at 2 coincidence (for example, switches SW1 and SW2), it is constituted so that the microphone 10 of the transmission section 32 may serve as ON. Therefore, although the other party will hear a voice with the third person of this interruption when the third person has wedged himself during a message with his own cordless handset 3 at the time of a talk state, it is made to a non-talk state by a microphone 10 becoming off as mentioned above.

[0011] Like hearing aid, while attaching a transmitter-receiver 4 in the external connection terminal 6 of a cellular phone 2 on the occasion of use, it hooks and a transmitter-receiver 5 is attached in a pocket person's lug through hook 21, according to the degree of the surrounding noise etc. so that a transmitter/receiver part 7 may enter into a lug exactly. If the switch SW1 which is in a transmitter-receiver 5 in an appropriate top is turned ON by long touch, a cellular phone 2 and a cordless handset 3 will be in a standby condition, and will be in the standby condition of waiting for arrival of the mail and dispatch.

[0012] Next, if the one-touch of the switch SW1 in a transmitter-receiver 5 is carried out, it will be in a talk state, and the sound collected from the microphone 10 of the transmission section 32 as shown in drawing 3 is sent to a switching circuit 38 from an amplifying circuit 37. At this time, a switching circuit 38 is turned on and off by the control circuit 45 by the pulse wave with a repeat frequency of 30-50kHz which people cannot recognize as voice. That is, between switching circuits 42, the timing used as ON is always shifted, when a switching circuit 38 is ON, a switching circuit 42 becomes off, and a switching circuit 38 is controlled by the switching timing from which a switching circuit 42 serves as ON, when a switching circuit 38 is OFF. Then, in case the signal sent to the amplifying circuit 39 is sent to the transmission system 31 containing a cellular phone 2, it is removed by the filter which added the switching component impressed in the switching circuit 38 to the amplifying circuit 39, and is sent to the transmission system 31. Sound-reinforcement of the signal sent to the other party is carried out by the transmission system 31 as voice through the cellular phone of the other party, or the loudspeaker 53 of the receiver section 36 of telephone. On the other hand, in the other party which heard this voice, voice is sent out to the transmission system 31 through the microphone 52 of the transmission section 35.

[0013] The signal sent by the cellular phone 2 which is the main phone contained in the transmission system 31 is sent to a switching circuit 42 from the amplifying circuit 41 of the receiver section 33, and sound-reinforcement is carried out by the loudspeaker 12 through an amplifying circuit 43 like the above. Two-way conversation will be made by this. When the microphone 10 of the transmission section 32 and the loudspeaker 12 of the receiver section 33 approach and are usually installed in such two-way conversation, Although the voice sound-reinforcement was carried out [voice] by the loudspeaker 12 is incorporated with a microphone 10, the loop formation that the voice sound-reinforcement was carried out [voice]

by the loudspeaker 53 of the other party through the transmission system 31 is incorporated by the microphone 52 of the other party is formed and an oscillation phenomenon happens. An oscillation is prevented by the on-off control of the switching circuits 38 and 42 by the above control circuits 45. Especially, although two-way conversation was difficult in the conventional thing (it was impossible to have made a microphone and a loudspeaker unify and to have carried out sound-collecting and pronunciation in a lug) when the noise of perimeters, such as inside of for example, an electric-car passage sound or a pachinko parlor, was severe, smooth two-way conversation became possible in the thing with the above oscillation prevention. Moreover, since gain control etc. is not needed, the volume adjustment at the time of the transmission-and-reception talk is possible.

[0014] In the above, there is no oscillation prevention circuit function as the gestalt of this operation that the other party is the same. In the case of the usual cellular phone, telephone, etc., do not produce a problem in two-way conversation, but when the same oscillation prevention circuit function is added. Since a poor message arises when coincidence or some gap has the control timing said wave number of the oscillation prevention circuit of both communication equipment. In such a case, before the other party sends out signals, such as voice, to the transmission system 31, the filter of the other party etc. removes the switching component of the other party like the above, and it must be sent out to the transmission system 31.

[0015] an oscillator circuit 49 is first operated previously as one example at the time of power-source ON so that the transmission section 32 and the receiver section 33 may not be in the operating state of coincidence in the above -- making -- oscillation prevention -- after being in a controllable condition, he is trying for all the circuits of transceiver circuits including the transmission section 32 and the receiver section 33 to be standing by. It becomes the reverse actuation at the time of power-source OFF.

[0016] Although the gestalt of operation showed loudspeakers 12 and 53 as communication equipment of the receiver sections 33 and 36, an earphone is sufficient as this. Moreover, the control circuit 45 which controls turning on and off of switching circuits 38 and 42 may not be passed for a desirable example to have been shown, either, but as long as concrete circuitry is the thing of this effect, other circuits are available for it.

[0017]

[Effect of the Invention] Since claim 1 thru/or invention of 2 consist of the above configurations, an oscillation phenomenon does not need to arise between the transmitter/receiver parts of both communication equipment, the transmission section and the receiver section can be installed in this ** or near, moreover it is not necessary to apply the gain control of oscillation prevention, and stable two-way conversation can be made possible. Two-way conversation is [epoch-making] possible, without especially being influenced at all of an external noise.

Moreover, since the configuration is simple, in addition to the ability to stop comparatively cheaply, manufacture cost can also expect the outstanding effectiveness that miniaturization and lightweight-ization can also be attained.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the schematic diagram showing the gestalt of 1 implementation of this invention.

[Drawing 2] a cordless handset -- it is the side elevation of a near transmitter-receiver.

[Drawing 3] a cordless handset -- they are block diagrams, such as an oscillation prevention circuit included in the near transmitter-receiver.

[Drawing 4] It is the drawing in which the switch timing of a switching circuit is shown.

[Description of Notations]

- 1 Wireless Electric-Wave Junction Section for Telephone
- 2 Cellular Phone (Mobile Communications)
- 3 Cordless Handset
- 4 Five Transmitter-receiver
- 6 External Connection Terminal
- 7 Transmitter/receiver Part
- 10 Microphone for Message
- 11 Incoming Call Delivery Volume Loudspeaker
- 12 Loudspeaker for Message
- SW1, SW2, SW3 Switch
- 21 23 Hook
- 31 Transmission System

32 35 Transmission section
33 36 Receiver section
37, 39, 41, 43 Amplifying circuit
38 42 Switching circuit
45 Control Circuit
46 47 Switch drive circuit
48 Flip-flop Circuit
49 Oscillator Circuit

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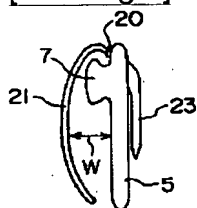
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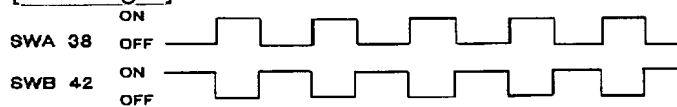
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DRAWINGS

[Drawing 2]

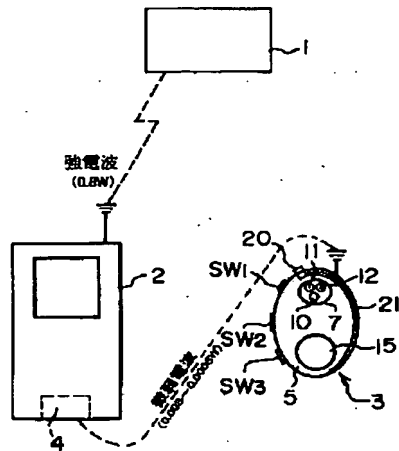


[Drawing 4]

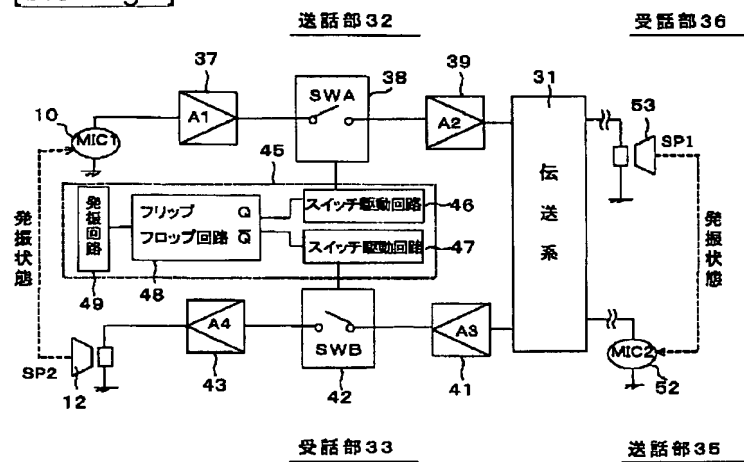


[Drawing 1]

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[Drawing 3]



[Translation done.]